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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

September 24, 1997

Mr. Willam F. Caton, Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Room 222  
Washington, D.C. 20554

Re: Comments of TDS Telecommunications Corporation  
on III. C.2 Platform Questions -- CC Docket No. 96-45

Dear Mr. Caton:

Transmitted herewith, on behalf of TDS Telecommunications Corporation, are an original and 9 copies of its comments on the III. C.2 platform questions in the above-referenced proceeding.

In the event of any questions concerning this matter, please communicate with this office.

Very truly yours,

  
Margot Smiley Humphrey

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SEP 24 1997

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of

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Federal-State Joint Board on  
Universal Service

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CC Docket No. 96-45

Forward-Looking Mechanism  
for High Cost Support for  
Non-Rural LECs

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CC Docket No. 97-160

**COMMENTS OF TDS TELECOMMUNICATIONS CORPORATION  
ON III.C.2 PLATFORM QUESTIONS**

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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LECs	)	

**COMMENTS OF TDS TELECOMMUNICATIONS CORPORATION ON III.C.2  
PLATFORM QUESTIONS**

TDS Telecommunications Corporation (TDS Telecom or TDS) submits these comments on the III.C.2 Questions of the FNPRM to develop a cost proxy for calculating high cost support for non-rural local exchange carriers (LECs). The 105 TDS-owned incumbent LECs (ILECs) are “rural telephone companies” and, thus, not within the scope of this proceeding. However, the Commission will next finalize a proxy plan for rural ILECs and will likely focus that proceeding on the non-rural model. Accordingly, TDS Telecom has offered comments to encourage the Commission to keep the unique needs and circumstances of rural ILEC service areas in mind as it proceeds here to avoid assumptions and conclusions that could prejudice the rural proxy proceeding and jeopardize rural universal service and infrastructure development.

## Overview

Although TDS Telecom is participating in the Commission's efforts to refine a cost proxy to the point where it can be validated as a good cost predictor, the Commission should be aware that TDS continues to oppose the basic assumption that the forward looking costs of constructing an imaginary, hyper-efficient new network reasonably reflect how a carrier would be able to price its services and recover its costs in a competitive network. Professor Kahn's December 1996 letter to the Chairman disputed whether this notion is even consistent with the kind of forward-looking costs that economists expect to observe in a marketplace that is functioning competitively. The imaginary network is inherently a monopoly model, since it is "designed" as if it were going to be the only network serving the area. Not only does that prevent it from modeling the real pressures of real companies making entry, exit and network design decisions and influencing whether a particular network design is efficient or infeasible, but it also assumes away the rural market problem entirely: More than one network in a thin market tends to involve cream skimming, which may improve service and lower rates for a few customers, but may well raise costs and rates and retard or stall market development for the average or outlying customers or smaller businesses. Indeed, the modeling process, where regulators make and place their imprimatur on particular "most efficient" network design and cost assumptions, can step over the line between predicting a competitive market outcome and driving network design and deployment: The assumptions that control the high cost recovery available to compensate a universal service provider may drive the way carriers design and build their networks, hoping to

better their chance for compensation that relates to their own costs. In that case, government network design will have usurped the role of competitive market forces and competitors' business and technical judgment.

However, TDS Telecom has discussed the rural service needs in its earlier comments and will not dwell extensively on its general concerns about the effect of an inappropriate proxy model on its ILECs' ability to meet their rural universal service responsibilities here. These comments will continue to bring TDS Telecom's considerable experience with serving and upgrading rural systems to bear on specific modeling issues under consideration, which are numbered below as they appear in the FNPRM.

## **Outside Plant Investment**

### **Paragraphs 55-59 — Plant Mix**

The Commission's discussion recognizes that the network design choice of what proportion of outside plant will be aerial, buried or underground cable involves more than just comparing the "first cost" of each type of plant. TDS designs its plant mix to reflect the life cycle and costs of the plant over time, taking into account the area's terrain, the population distribution and rate of growth, the capacity of the plant to be installed and the relative costs of maintaining, expanding, upgrading or replacing aerial, buried and underground plant.

For rural areas, and particularly those served by rural telephone companies, the predicted pace of technological change can spell the difference in whether it is reasonable to anticipate that plant will be adequate over the economic life of the facilities or whether more advanced technology is likely to change market requirements and force accelerated replacement. The "lifetime" cost may be quite different from the plant's technical life expectancy. The

Commission's prescription of a cost methodology that will limit high cost support to a regularly updated optimally efficient network and the prospect of competitive inroads on an ILEC with prematurely obsolete facilities adds to the risk of investing extensive capital in a network design that is harder to update. In addition, a rural ILEC with one large customer or high volume area will need to be especially agile in responding as technology advances to ward off cream skimming or cherry-picking by a competitor that is not saddled with an existing network designed to satisfy the duty of area-wide universal service. Thus, there is more to plant mix decisions than the up front and ongoing costs of each type of installation.

Owing to the multitude of variables that affect the optimal plant mix, the ability to adjust proxy model inputs to accommodate local conditions will be critical. For example, a model that assumes less aerial plant in areas of higher population density will not accurately predict the costs of network designs that often include aerial plant in some dense areas. Even worse, mistakes in the proxy assumptions may distort the planning process: Carriers will have an incentive to take into account their ability to recover their costs and to skew their plant mix design to tally with what the model presumes, rather than the most efficient and cost effective plan. In addition, the growing reliance on Digital Loop Carrier is diminishing the proportion of underground plant installed. The proxy model will need to incorporate some longer trends in network design to encourage efficiencies that may change patterns of cost incurrence and cost recovery.

Another key variable overlooked by models without extensive room for individualized inputs and sufficient recognition of non-engineering design factors is the cost impact of highly disparate local right-of-way regulations and practices. For example, TDS Telecom is

encountering construction bids 30% above its expectations in Delta County, Colorado, because of local permit requirements. Indeed, as the result of conditions the local authority attaches to its legally-required permits, a contractor there is routinely required to incur the cost of improvements to the county owned right-of-way beyond what is necessary for its own installation project. Another trend in installation cost variables related to the exercise of local government authority over rights-of-way is the growing popularity of annual fees imposed by state and local authorities eager to obtain revenues. These revenue-raising measures, not captured by any general cost assumptions in a model, require case by case input because they carry different labels and may raise costs indirectly, as with the county road straightening conditions, or using different measures to assess fees. TDS Telecom has encountered charges on cable rights-of-way in Minnesota based on the extent of the facilities installed; some other authorities gear the required payments to the revenues produced using the public rights-of-way under their control.

Even more difficult to capture in a model are patterns of plant mix in various regions of the country that cannot be tied back to any particular condition or cluster of conditions. For example, there is more reliance on aerial cable in Eastern and Southeastern states, greater reliance on buried plant in the central parts of the US and greater variability in cable plant mix in the Western states. It would be impossible to identify all the factors that result in such regional solutions. The design of the proper plant mix is far from a cut-and-dried mathematical exercise. Original calculations and predictions may need to be revised: ILECs that borrow under Rural Utilities Service telephone programs often find that their proposals for plant mix must be



changed when construction plans are altered during the field-staking phase.<sup>1</sup> A model cannot build in what network designers only find out by testing their plans against the complex reality of their locality.

If a forward looking proxy model is applied to rural telephone companies without opportunity for individual input that takes the many variables into account, and some sort of flexibility for redesign when necessary, the error in cost prediction can be considerable. At the same time, rural telephone companies will find it particularly difficult to use, analyze and comply with a model that is complex enough to capture real-world plant mix design and cost variations.

#### **Paragraphs 60-70 — Installation and Cable Costs**

The Commission realizes the need to identify and incorporate in any reliable proxy model the variables that control or significantly influence differences in cable installation costs. TDS Telecom's experience bears out the importance of soil type and line density. However, TDS has not found that there is a direct relationship between cable length and soil conditions that would justify a simple multiplier, although soil conditions are a significant cost factor that must be taken into account in the model's algorithm. It also makes more sense to relate cost to the density of access lines per square mile than to the density of households per square mile; households are

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<sup>1</sup> TDS Telecom understands that the Commission's staff indicated at a recent proxy model workshop that RUS proffers of actual rural installation data were not useful in this non-rural LEC proceeding. The RTC hopes that the Commission will keep in mind this deliberate exclusion of rural ILEC information here and withdraw its decision to limit the Rural Task Force to analyzing and suggesting how to adjust the model developed in this non-rural phase to apply it to rural ILECs.

not a reliable surrogate for access lines.<sup>2</sup> TDS Telecom also does not differentiate between feeder and distribution cable in its network design process: Since cable plant can be used simultaneously for feeder and distribution purposes, TDS treats the costs of the two categories as identical.

In this cost context, again, TDS Telecom believes that tables allowing individualized adjustments to reflect actual data are more likely to provide reliable predictions than general factors or multipliers that minimize local differences in costs and conditions. It would cause fatal distortions to cost predictions to use a national average of contract and construction prices: The prices of various cost factors differ dramatically from place to place, and the variations are the result of many different conditions. Consider, for example, the effect of seasonal differences on costs. In much of California and Arizona, construction can take place year-round. In contrast, Wisconsin weather does not permit most construction projects during the winter. In addition to direct impacts on the cost and timing of installations in seasonal and non-seasonal markets, TDS Telecom has also found that it sometimes can result in cost savings in Arizona to hire labor from Wisconsin in the winter months when there are few if any construction jobs in Wisconsin. There seem to be endless examples of such variations, raising and lowering costs, that militate against generalized nationwide or even state-wide assumptions.

The Commission should also be leery about forward looking assumptions about the usefulness and cost of different technologies before a strategy to control high outside plant costs

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<sup>2</sup> By the same token, since number and density of lines play an important role in network design and costs, all lines in high cost rural locations -- not just "primary" lines -- should be eligible for high cost support.

has been proved satisfactory in quality and availability, as well as cost. For example, point-to-point radio technology has been successfully used to serve relatively remote clusters of population. However, the costs and quality of radio-based loops remain uncertain. Moreover, the Commission should avoid incorporating a radio technology into either the plant mix or cost assumptions of its model that does not allow for individual model adjustments based on the availability of spectrum. It would violate the Commission's competitive neutrality standard to penalize an ILEC, for example, by depriving it of high cost support beyond the cost of radio technology, but deny it access to the spectrum technology or licenses within the Commission's control (such as LMDS or primary use of BETRs frequencies) that are necessary to realize the model's "forward looking" cost efficiencies.<sup>3</sup>

#### **Paragraphs 70-75 — Drops**

TDS Telecom suspects that its average drop costs will exceed the average drop costs that will be proposed in the final non-rural models. Typically, TDS ILECs' drops are designed to enter the structure where the power enters, and at the side or back. At present, it is difficult to compare the models with the experience of rural telephone systems. There may not be a way to figure an inflexible assumption for drop length or the path taken by the drop. For one thing, it appears that the definition of "drop" is not consistent throughout the local exchange industry. For example, the TDS Telecom ILECs calculate drop costs and keep their records using the RUS definition of loop — the last 300 feet of the line from the pedestal to a house, not including the

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<sup>3</sup> By the same token, the Commission needs to find a way not to provide support to radio licensees for costs they can avoid because of their preferential, government-controlled access to spectrum and licenses. Otherwise, it will be impossible to satisfy the statutory requirement in section 254(e) that support be used only for providing universal service.

cost of the Network Interface Device (NID) mounted on a residential subscriber's house or a business's building. The pedestal and terminal are included in the cable cost. Since it appears that other parts of the industry and the models may include the pedestal and perhaps even the NID in the cost reported for the drop, any comparison may suffer from the "apples to oranges" problem.<sup>4</sup>

As with other outside plant cost prediction, cost predictions for drops should look at the life cycle of the plant. Here, again, drop requirements are changing. TDS Telecom ILECs have so far installed any requested fiber cable to a customer or high volume site on a case-by-case basis. Fiber cable is necessary for higher bandwidth applications, but costs more than copper cable because of its higher termination costs. Drops may get cut or knocked down and need replacement. A valid model would have to be able to predict the costs associated with such disparate circumstances.

#### **Paragraphs 76- 82 — Structure Sharing**

The proposed proxy cost models seek to predict when facilities can be shared to save on construction costs. As usual, the considerations are considerably more complicated than the models and the Commission's discussion assume, and a valid model will have to incorporate more differences in facilities, carriers and locales.

The experience of TDS Telecom in network designs for its rural ILECs indicates that the opportunities for sharing that benefits ILEC customers vary in different areas of the country and

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<sup>4</sup> There may be other undiscovered differences in the definitions assumed in the models. This potential for significant hidden discrepancies provides yet another example of why the Commission should not start the rural LEC proxy design phase with any preconceived idea that the non-rural proxy should apply, as adopted in this phase or with minor adjustments.

for different types of installations. Beneficial sharing is most often possible in new subdivisions, where sharing arrangements can be implemented from the outset of network design and construction. Upgrades of existing facilities offer less potential for savings from sharing. Beyond that, the potential benefits of sharing with other types of utilities differ significantly depending on the nature of the other utility's network design needs and objectives and the nature and location of the plant to be constructed.

TDS Telecom has found in the Eastern and Southern states, where there is a higher proportion of aerial pole lines, that joint use and joint ownership of the poles is more common than elsewhere. For example, 70% of the existing outside plant of its Vernon, New York, ILEC, is aerial, and 90% of that uses jointly-owned poles. Its Delta County, Colorado, ILEC has been able to save on construction costs by placing cable jointly with the water lines, which carry the area's water supply, derived from mountain run-off. In contrast, sharing is not feasible in many areas and presents greater problems with certain other utilities' networks. Sharing with electric utilities is often not possible because of the need for adequate separation of the two facilities for safety reasons. In addition, power lines are often aerial in places where buried plant or conduit is the optimal plant choice for the telephone network.

Aside from subdivisions, much of the telephone construction using standard cable plows on main lines is not shared. Moreover, it cannot be assumed that legal requirements for equal access to poles, ducts, conduits and rights-of-way, which were adopted to facilitate local competition, will result in cost savings for ILECs and their customers. For example, it may well be much cheaper for the competitor to use the incumbent's right-of-way, rather than finding and

acquiring suitable right-of-way arrangements for itself.<sup>5</sup> The ILEC and its customers do not benefit equally, if indeed they benefit at all, from cost savings owing to this compulsory sharing. Indeed, it is hard to understand how the cost for piggy-backing on an ILEC's right-of-way arrangements can be viewed as a forward looking cost at all, since the "forward-looking" proxy approach theoretically posits a new, start-up, optimally efficient network, not one that builds upon the existing ILEC network.

It should also be recognized that sharing adds costs of its own to construction, such as the expense of additional handling, engineering and coordination. Timing is important in construction, for example, and the coordinating utilities must have their materials on site simultaneously at the planned time to avoid cost add ons in the construction project. Involving an additional player makes these logistics more difficult. There are also significant differences in how the costs are divided between structure sharing companies. It can obviously change the ILEC's installation costs significantly if the cost of shared installation is split on the basis of the relative size of the cables placed, split 50-50 or apportioned by some other agreed-upon measure. A model that ignores differences of that sort will not be reliable.

### **Paragraphs 83-95 — Loop Design**

#### **( 1) Paras. 84-88 — Fiber-Copper Cross-Over Point**

There is not one, specific fiber-copper cross-over point that can be assumed across-the-board for all types of service territory. This is an area where rural and urban differences and the

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<sup>5</sup> The same kind of differences in how regulatory requirements and policies affect ILECs and their competitors drives the grave concern among rural ILECs with the Commission's failure to allow them to disaggregate their support to reflect cost differences within their service areas.

nature of demand in a particular study must be taken into account, especially in rural network design and costing. A model without the ability to alter the inputs to accommodate these differences will not be a valid predictor for rural markets. For example, TDS Telecom regards 18,000 as the maximum for copper distribution in rural areas. An 18,000 cross-over maximum is not suitable to meet the needs of urban markets or some rural customers' needs. In TDS Telecom ILECs' serving areas that have a large customer or industrial park with need for fiber cable, the most cost-effective economically feasible solution so far has been to construct dedicated fiber cable to the customer or location. Engineering constraints alone cannot dictate a model that will predict the technically necessary or optimal cross-over point for a particular network installation.

**( 2) Paras. 88-89 — Loop Standards**

Some set of standards is necessarily assumed in any network as the objective to which that network will be engineered. For example, TDS Telecom limits the length of loops in its rural networks to 18,000 feet. However, any standard must have built in flexibility to allow case-by-case solutions for outlying situations. Given the widely varied conditions faced by rural ILECs, a cost model must not incorporate standards that a rural area is unlikely to be able to support on its own, unless the necessary universal service support to achieve the standard is also made available. In any event, the proxy cost model must not assume that any standard can be met in every network design, and must, accordingly, have flexibility for individual adjustments.

**Paragraphs 95-102 — Wireless Threshold**

The Commission (para. 99) expects the model it chooses to estimate "to the extent practical" the use of wireless technology whenever that approach is "likely to be the least-cost,

most efficient technology.” However, it observes that there is little information in the record that would help to estimate wireless costs or determine whether wireless would be “more economical.”

One question associated with the wireline-based model proposals is whether there is a cost level at which it should be assumed that wireless, rather than wireline, technology would be used. TDS Telecom believes that there are quality of service issues that should come into play in any such determination, given the present (albeit rapidly improving) characteristics of radio-based telephone service. So far, wireless service does not achieve the quality level of the wired network.

Models that attempt to build in comparisons between the efficiency of wireline and wireless outside plant must also be based upon an adequately detailed model for wireless costs to reflect terrain limitations or other factors that may make radio service infeasible or increase the costs in particular locations. The RUS has also emphasized that the number of subscribers to be served and to support the system with their revenues and whether each location must be served by a separate radio system complicate any effort to assume a fixed cost-per-subscriber cross-over point when radio would be more cost-effective than wireline technology.

In the absence of a fully developed forward looking economic cost proxy for wireless services, TDS Telecom questions whether generalizations about the relative cost and efficiency of wireline and wireless systems can be validated adequately to base any cost recovery — i.e. carrier compensation — determination on such a comparison. The Commission must accordingly be cautious about building in assumptions about more efficient service based on inadequate information or without thorough validation. For example, consider a rural portion of



a non-rural company's service area that does not offer sufficient profitability to attract entry by another system. In that case, the incumbent ILEC would continue to provide universal service as the carrier of last resort, using its existing wireline network. However, if high cost compensation for an area with those characteristics has been calculated under the assumption that wireless service would reduce the costs for a "least-cost, most efficient" technology, the costs of the actual universal service provider will be ignored by the model. The resulting high cost compensation would not be sufficient to support the ILEC's high cost service, but the open invitation for competition in its more profitable areas would prevent it from supporting below-cost rates in the high cost segment. Without revenues from higher local rates or some other source, or reductions in the quality of service, the ILEC would not be able to sustain that service.

#### **Paragraphs 103-119 — Miscellaneous Outside Plant Input Value Issues**

##### **Paras. 118-19 — Fill Factors and Utilization**

The question of fill factors and utilization is one that exposes the inadequacy of the single, most-efficient, network view that is inherent in the proposed models and the Commission's basic proxy assumptions. The models effectively provide a snapshot, frozen in time, of the hypothetical network -- without allowing for any effects from the market competition and changes in market share, demand and traffic volume the models should mimic. If more than one competitor carrier actually used the model as a template for construction, right at the time of the "snapshot", there would be a profound effect on whether the predicted fill factors and utilization would be reasonable. In short, the fill factors and utilization modeled in a "competitive" network design engineered for optimal efficiency to serve the population levels, density, clustering, loop lengths and other characteristics of an entire area presume that the marketplace will remain non-

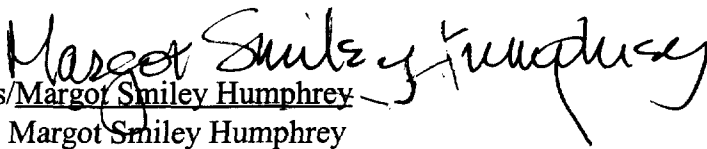
competitive.

### Conclusion

TDS Telecom recognizes the enormity of the task the Commission has undertaken here. However, its task in the non-rural phase of its proxy deliberations will be more difficult, complicated and subject to challenge if it does not attempt to avoid committing itself here to assumptions or approaches that will not work for rural ILEC areas. TDS urges the Commission to be cautious and well-informed about the potential for adverse side effects for such rural ILECs and their customers from the conclusions reached in this proceeding.

Respectfully submitted,

TDS TELECOMMUNICATIONS  
CORPORATION, INC.

By:   
/s/ Margot Smiley Humphrey  
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September 24, 1997

CERTIFICATE OF SERVICE

I, Sheila V. Hickman, a secretary in the office of Koteen & Naftalin, L.L.P. hereby certify that true copies of the foregoing Comments of TDS Telecommunications Corporation, Inc. have been served on the parties on the attached service list, via first class mail, postage prepaid, on the 24th day of September, 1997.

By:   
Sheila V. Hickman

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